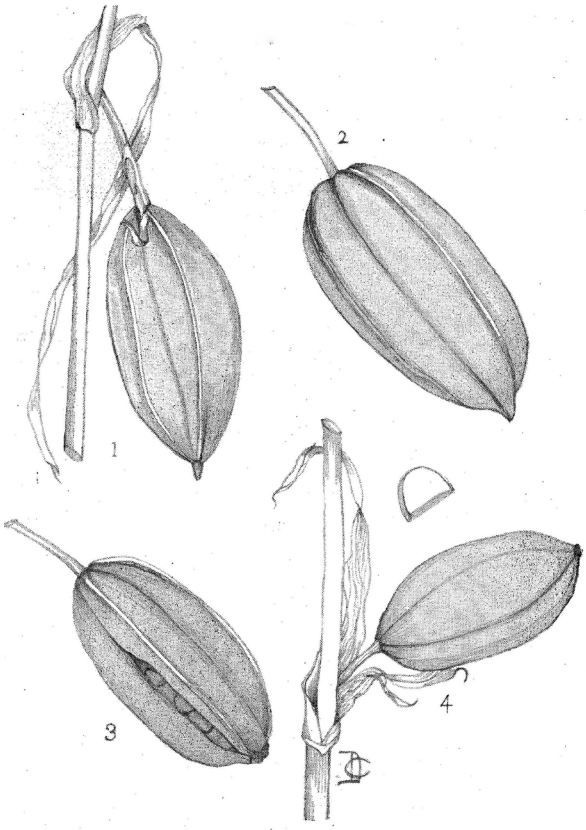
It's About Time To Grow Some Irises From Seed

~Story and illustrations provided by Patrick O' Connor

Now may seem like an odd time of the year for an article on growing Louisiana irises from seeds. At present, there are none at hand. Only during bloom season will the seed pods begin to form, and then they will quickly be visible if a bee or human has pollinated a flower. The seeds will be mature enough to harvest and plant some weeks (more on this later) after the bloom season ends.

Now is a good time, however, to think about growing a few irises from seed to expand your planting at no cost or just to satisfy your curiosity about what a brand-new hybrid might look like. If you have nice irises already, there is a good chance that you will produce something beautiful and possibly unique.



Drawings by Caroline Dormon of pods from collected irises of different colors ranging from white to deep violet-blue, but all forms of I. giganticaerulea. AIS Bulletin, January 1948.

It is also a good time to think through the process. How do you get from this year's flowers to a new hybrid in a couple of seasons? It is not difficult, but there are things to know. It never hurts to plan. During the bloom season, you'll need to decide if you want to pollinate a few flowers or allow the bees to do the work. One way or the other, if you grow irises, you will have seed pods in your garden. Of course, they can always be cut off and discarded, but if you choose to try your hand at growing out seedlings, you'll benefit from a few tips.

One might think it would be better to start with instructions on how to cross-pollinate a Louisiana iris. There is a good case for that since it's the way to get seeds from the parents you like most. While you can readily find descriptions of how to pollinate an iris flower in books and on the internet (references below), the best way is to find a real person to give a live demonstration. Making a cross is easy if you see it done once, but frequently it is difficult to match the iris parts you see in real time with those in drawings or pictures. The descriptions are better these days, but I have not forgotten the first year that I tried to make crosses based upon drawings from an SLI publication from the 1970s. I wound up putting the pollen in the wrong place, and none of my crosses were successful. It was humiliating, but the bee-crossed seeds I planted produced some very nice irises, some of which were named and are still grown today.

The bees know how it is done, and they are prolific. If you do nothing, here is what will happen. Bees will pollinate flowers, and seed pods will begin to form in the ovary, located in the stem between the flower and the stalk. Swelling will be evident within a few days or weeks. Within a month or so, the pods will be fully formed. If allowed to remain on the stalks, in about eight weeks many of the pods will begin to turn yellow and perhaps split open. Some seeds may spill out. Left alone, all the seed pods eventually will turn brown and fall to the ground where the pods will deteriorate, and any remaining seeds will come into contact with the soil. The number of seeds in a pod varies with the particular iris but generally will range from 20 to 60. Many seeds will be destroyed by insects that will burrow through the corky seed coating and devour the core of the seed inside. A few will germinate where they fall, and new seedlings will begin to grow among the existing irises. If not destroyed by weeding and cleanup, a few could grow to blooming size irises, not by the next bloom season but the one following that.

If you can get new seedlings by doing nothing, how difficult can it be to succeed with the application of a more systematic approach? It's pretty hard to fail completely.

Keeping It Simple

One easy, traditional approach is as follows:

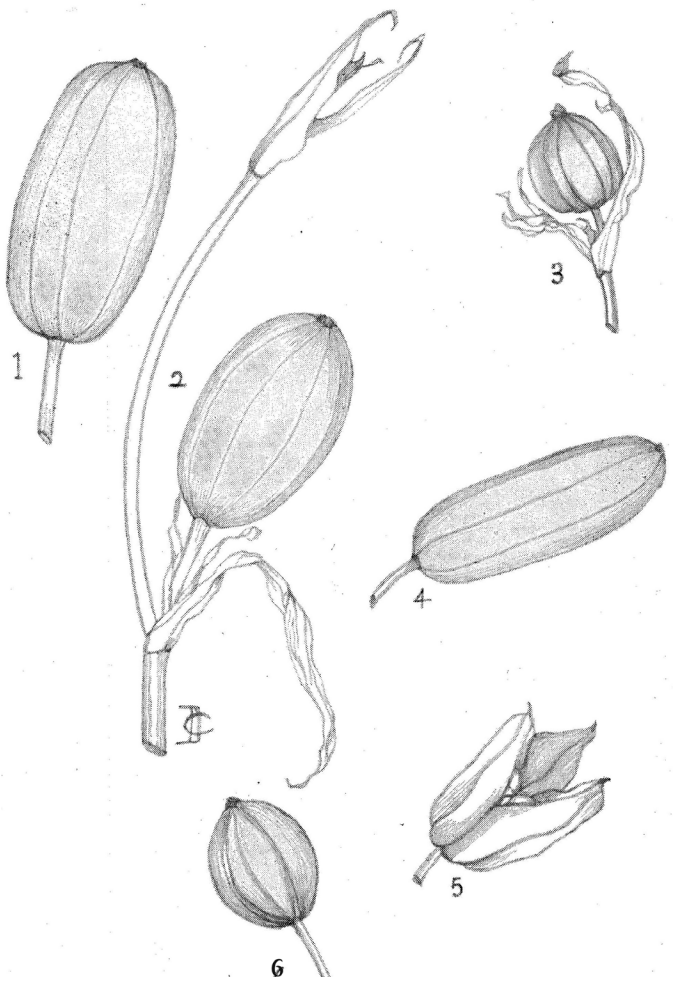
1. Harvest seeds when the pods begin to yellow and crack open, usually about eight weeks from the end of bloom.
2. Lightly score the pod with a sharp blade along several of the indentations and ridges in the pod, pry open and remove all seeds.
3. Immediately plant the seeds in pots (one pod per pot) using a high-quality potting soil. Don't allow the seeds to dry out. Optionally, soak them in water for a day or two in advance of planting.
4. Cover each seed with about ¾ inch of the medium.
5. Water well and place in a shady location. Keep the pot moist but not soggy.
6. Monitor the pots to be sure that the seeds do not become exposed on the surface where they will be prey for insects; if they do pop up, push them down or add more soil.
7. Germination should begin in the fall or when nighttime temperatures begin to drop (usually November in Louisiana).
8. In a mild climate such as Louisiana, the seedlings are removed from the pot and planted directly into a garden bed in late January or early February, or they can be potted for later planting. In cold areas where planting in the dead of winter is not wise, potting – and protection of the seedlings – is required.

Most seeds that will germinate by this method will do so in the first year, but if not damaged by exposure or insects, additional germination may occur at roughly the same time the following year.

Varying Approaches, But First ….

There are simple variations of this process, described below, that are employed with success. There also are more heroic, time-consuming and expensive interventions you can apply if your interest takes you there and your lab is properly equipped. No lab? No problem. You can still try out some proven alternative approaches. They may require a little more time but could bump up the germination rate and be worth it to you.

The alternative methods of germinating iris seeds mostly deal with essentially the same issues. How to maximize the germination rate and, to a lesser extent, how to induce germination more quickly. As with the seeds of many plants, there is an issue of *dormancy* in iris seeds. Viable seeds are said to be in a dormant state when, given that the principal conditions required for germination are met – mainly water,



Caroline Dormon's drawing of the pods of a variety of species. 1 and 2 are I. nelsonii. 3 is the diminutive I. brevicaulis. 4 and 5 are collected plants from near New Orleans, perhaps natural hybrids, although the elongated shape of 4 is similar to I. virginica pods. 6 is a pod of I. fulva

gasses (air or oxygen), and an appropriate temperature – they nonetheless do not germinate for some time.. Or maybe never if the conditions to break dormancy are not achieved. Unlike radishes, which germinate prolifically and almost immediately (but which have considerably less attractive flowers), iris seeds germinate at a much lower rate due to natural barriers that must be overcome.

Plants presumably evolve patterns of seed dormancy because they are beneficial to survival. For example, early germination of seed in the fall just as crippling winter weather approaches may be less successful for a species than a period of dormancy that delays germination until after the danger of killing temperatures for tender seedlings has passed. In experiments that sped up the time of germination of Louisiana iris seeds, Joe Mertzweiller in Baton Rouge noted that he lost far more seedlings in the humid summer months due to damping off disease with early germination than he did with normal, and later, germination in mild

Louisiana winter weather.

When seeds germinate after falling to the ground, or hopefully in one of your pots, dormancy has been broken by the conditions to which they were exposed over some time. This success is not achieved for all seeds produced, however. If you read hybridizers and scientists on the subject of iris seed germination, you will find a bemoaning of "normal" germination rates of only 20 to 35 percent. As an amateur hybridizer who has mostly followed the keep-it-simple approach, my experience has been roughly in this range, although some crosses of hybrid seeds will hardly germinate at all and a few may approach 85 or 90 percent.

The core issue that hybridizers and others deal with is how to impose conditions that do a better job of breaking the barriers to germination than occur "naturally" (meaning just planting them in a pot or sticking them in the ground). Inhibitors to germination are said to be both physical and chemical (thankfully not psychological, although we can't speak for the hybridizers themselves). But what, specifically, *are* the barriers that nature has evolved to suppress germination of iris seeds? There are theories and a few answers.

But first … again … keep in mind that the "seeds" you see when a pod splits open are only part of the story. Every seed consists of three parts: a protective *outer coating*, an *embryo* (the new plant), and *endosperm*, which is a food supply for the new plant. Louisiana iris seeds have a rather thick outer coating composed a light, corky material that enables the seed to float, a convenient feature in their wetland home (but perhaps making them resistant to water penetration). Inside, the core of the seed is BB-shaped but slightly smaller. It contains the embryo and the endosperm that will nourish the new seedling between germination and the time it is planted.

GNOIS board member Cynthia Maldonado with a bountiful harvest of I. giganticaerulea seeds from the 2018 season.

Research on iris seeds (mainly on other types of irises) suggests that the physical and

chemical inhibitors to germination could involve all three of the parts of the seed. Louisiana iris seeds, in particular, have been little studied, and even for more widely grown types of irises, much more scientific study would be required for full understanding. But the most significant known barrier to germination in Louisianas is *the corky outer seed coating that inhibits water from reaching the core seed inside.*

Moisture is directly required for germination, and a flow of water may also be required to wash away or dissolve chemical substances that themselves are inhibitors that prevent germination. Outdoors in your keep-it-simple pot, rain and hand watering accomplish this to some extent. But various degrees of scarification have been employed to improve on the process and bump up the germination rate. Scarification involves "weakening, opening, or otherwise altering the coat of a seed to encourage germination," One form this commonly takes with iris seeds is to carefully chip the corky coating of each seed to allow water to more readily permeate it. A further step is to peel away the corky coating entirely, leaving only the BB-shaped seed core to be planted. An even more aggressive step is to cut the outer edge of the seed core slightly.

Does this work? Studies are mixed concerning chipping, but it seems to make little difference. Peeling off the corky coating is more effective. In a 1995 SLI Special Publication, Joe Mertzweiller reported on an experiment he ran comparing methods of planting. Working with a mix of almost 1,200 seeds from eight different crosses using good hybrids (for genetic diversity), Joe hydrated the seeds for three to four days. Then he applied one of five planting methods. Several involved "cutting a very thin slice off the embryo end of the seed before planting." A couple added a longer soaking: "a room temperature stratification for five to six weeks in a moisture-controlled planting medium." This step presumably amplifies the application of water to wash away or dissolve chemical inhibitors to germination.

Along with the resulting overall germination percent, the methods were:

A. 24% Seed coat chipped

B. 34% Entire seed coat removed

C. 31% Entire seed coat removed, light cut into seed core

D. 46% Entire seed coat removed, light cut, stratified by additional hydration consisting of 5-6 weeks at room temperature

E. 31% Entire seed coat removed, deeper cut, stratified by additional hydration consisting of 5-6 weeks at room temperature

Unfortunately, Joe did not report on a control group planted by the keep-it-simple method. The 24% germination rate reported by merely chipping the seed, however, does not represent much, if any, improvement on the approach. Do these variations look like a lot of work? You bet. Anytime you have to manipulate individual seeds rather than planting them in mass in a pot, you up the time required by a good bit. Compared to the keep-it-simple method, are the more labor-intensive methods worthwhile? You can raise the germination rate a bit, but whether that is worth the additional time and trouble is up to the individual.

If you soak seeds for a few days that may add beneficial hydration, and it will make it possible to remove the corky outer coating. Just chipping the seed is easier, but probably will only marginally improve germination, if at all. A longer stratification would not be a lot of trouble. For some types of irises, stratification at cold temperatures has been found effective, but there is no evidence that refrigeration is a benefit in germinating Louisiana iris seeds. Scarification by cutting into the seed itself sounds like a job for a person wishing to experiment, or a sadist, and is not a recommended gardening technique.

When To Harvest and Plant Seeds

There are variations in planting technique that don't seem to be directly related to breaking dormancy, but they nonetheless work well to germinate seed. I had always heard that Louisiana seeds should be harvested as the pods turn yellow and then planted immediately. The story was that if the seeds are allowed to dry out, they will go into a sort of "double dormancy" and not germinate the first year. (Dried seeds may remain viable for several years at least.) If I looked, I might be able to find and document this old advice, but the important thing is that it is wrong.

Consider an alternative technique described by Hooker Nichols, a Dallas hybridizer, in the Fall 2017 *Fleur de Lis*.

1. All pods are allowed to turn fully brown on the plant stalks.
2. Pods are then placed in cups until the fall when the pods are "shelled" using pliers [Note: by fall the pod will be quite hard and not at all pliable]
3. The cork coating on each seed is carefully cracked, and the inner core is removed
4. The seeds are labeled, bagged, and stored until February
5. In February, gallon pots are filled with Miracle-Gro potting soil, and the seeds are placed on top and covered with two inches of soil. Pots are watered to keep the soil moist.
6. Germination begins in the spring within about four weeks depending on soil temperature.
7. When three inches tall, seedlings are potted in gallon pots, watered with liquid fertilizer each week, and planted into the garden in September. The following spring, nearly 100 percent of the seedlings bloom.
8. The pots are held, and additional germination may occur the following fall.

Hooker did not report a germination rate for his seeds, so this technique can't be compared on that basis to other approaches. But obviously, this alternative works. The end result of nearly 100 percent bloom of seedlings two years after a flower was pollinated seems to be the same experience as with other approaches, but the intermediate steps are very different in their timing. With the keep-it-simple procedure, seedlings germinate (in Louisiana) in November, and are planted into the garden the following January or February. At that time, Hooker's seedlings are just germinating. In neither case is there bloom the following April. With Hooker's treatment of the potted seedlings during the following year, and with planting into the garden in September, he nonetheless achieves bloom by the next spring – which is the same time as first bloom via the "simple" method.

Here is something else, though. The conventional wisdom has been that one should not harvest seeds until they have "matured" – meaning when the irises are getting ready to shed their seeds (dehisce) on their own. The idea is that important changes occur between the forming of the seeds and dehiscence that are essential for viability and germination. Some authorities note that in many plants, these "after-ripening" processes are essential. It might seem to be common sense that Mother Nature expells the seed from the pod only when they are "ready." Governed by this logic, I have refrained from taking seed until the Fourth of July. That is about the time in Louisiana when the pods are mature. It is also easy to remember, and before I retired, it gave me a long weekend. (Now every day is Saturday, except Sunday when there is a larger newspaper).

But an accidental experiment with *giganticaerulea* seed gathered by Mark Schexnayder this past spring showed that this conventional wisdom is not reliable. In a wild location with vast colonies of *giganticaerulea*, Mark collected a large number of pods on May 10, only a month or so after bloom. An experiment was not the rationale for the collecting; it was the knowledge that with the growth of other plants in the area and the presence of snakes, these seed pods would not be accessible in July. With no expectation of good germination – but with hope for a few new plants – Mark collected and brought a couple of buckets of seed pods to the Greater New Orleans Iris Society nursery in City Park. Volunteers shucked and planted the seeds by the keep-it-simple method in late May.

The pictures above record the germination that has occurred in all these pots. No record was kept of the number of seeds planted in the eleven seven-gallon pots shown, but they were spread thickly, perhaps with as much space between the seeds as the seeds were wide. The germination rate "looks" to be about as good as my best experience with the simple method.

Mark also threw unopened, leftover pods in a large pot on top of some old soil. With no intention to work with them further, the pot with the un-shucked pods was just left on the warmest side of his house and given no attention. The pods deteriorated, and the seeds were covered only by the rotted organic material. What occurred, as shown in the picture, was extensive germination. The seedlings are as thick as grass. After the pods deteriorated, the seeds were also thickly packed, of course. It may be that *giganticaerulea* seeds germinate readily, and certainly more freely than many hybrid crosses. A look at the mass of seedlings in this pot, however, suggests the hypothesis that rotting material from the pods might contain substances that break down chemical germination inhibitors contained in the seed. Perhaps worth an experiment.

Iris gardeners should keep in mind that the best handling of iris seeds must be adapted to their region of the country. The advice of Kevin Vaughn in his excellent *Beardless Irises: A Plant for Every Garden Situation* is on point:

> *After approximately eight weeks of development, the pod will turn brownish and start to split. The seed may be harvested at this time and spread out in little plastic weighing boats or small plastic dishes so that the seed may dry in a cool place…. In treating the seed this way, you have allowed the seed to after-ripen so that the inhibitors have developed in the seed coat and the majority of the seed will not germinate until spring, lowering the chances of it being killed in the winter. An exception to this generality would be if you lived in very benign climates, such as coastal California or along the Gulf Coast; seeds of both spuria and Louisiana irises may be picked as soon as the pod begins to split or turn brown and planted directly. In the case of the Louisiana iris seeds, the corky layer of the seeds may be peeled free of the rest of the seed, further eliminating a barrier to germination. The seeds are then soaked briefly and planted directly in pots. Germination can occur within as little as two weeks.*

Even in benign climates, the young growing seedlings must be protected from any cold. Growing them in protected sites, a cool greenhouse or in a cold frame is required or else the tender young seedlings will be killed. ....

If you live in a less benign climate, allowing the seeds to dry and planting them later in the fall, will prevent any early germination so that the bulk of the seedlings will germinate in the springtime. I plant in 6- to 8" pots using a good sterile potting mix. The seeds are put along the surface of the potting medium, and an additional inch of potting mix is applied over the top. ... The pots are kept moist and allowed to be exposed to the elements. The constant moisture and cooler temperatures will eventually wash out the germination inhibitors present in the seed and allow the seed to germinate in springtime. Seeds of spuria and Louisiana irises are the most difficult to germinate and often the seeds will not germinate the first spring but often will germinate the following spring. Keep the pots in a cool, shaded position over the summer and make sure the pots don't dry out completely. In the case of Louisiana irises, removing the corky seed coat will often facilitate germination.

Avoid Excessive Moisture

Keeping seedling pots moist is essential, but too much water inhibits germination. Seeds require a certain amount of air, presumably oxygen, to germinate. Waterlogged pots are counterproductive. The worst germination I have had was when I had the bright idea to hold the seedling pots in a kiddie pool in water so I would not have to hand water. An inch or two of water may have been fine (and has worked for others) but the deeper water in my pools rotted the seeds.

This year, Gary Fine at Nicholls State University in Thibodaux, Louisiana achieved 82 percent germination with *I. giganticaerulea* seeds planted in peat and kept moist but not soggy. Another batch of seeds with additional water that allowed some saturation of the media yielded only 30-40 percent germination.

SLI member Steve Shepard of Ocean Springs, MS, once conducted an experiment I which he floated Louisiana iris seeds in water to see if they would germinate. Over several years and thousands of seeds, Steve found that some seeds (especially if harvested early) sank and rotted, but others floated, stayed viable, and eventually germinated. His success rate varied widely with the parent cultivar, but overall was around 20 percent. Interesting and educational, but not a technique that improves on others.

No doubt others with experience over the years can cite bad practices as well as promising variations. As I think it is required to say, don't plant Louisiana iris seeds if you are allergic to Louisiana iris seeds. Otherwise, give it a try, even on a small scale. It is a real thrill to bloom flowers never before seen.

References

The best written description of the process of crossing two Louisiana irises is in SLI's book *The Louisiana Iris: The Taming of a Native American Wildflower, 2nd ed., Chapter 5.*

More vivid illustrations of the process can be found on the internet, although there is not an example dealing with Louisianas specifically. Hybridizing other types of irises is very similar, however. For a clear explanation, google "You Tube Iris Breeding at Stout Gardens".

Garden Reviewers Needed!!

The Fleur needs volunteer writers & photographers to sign up to write reviews of the gardens on the 2019 SLI tours!

Written submissions need to be a minimum of 500 words. Photographs need to be titled. These are some of the various events to be covered:

- **Baton Rouge Botanical Gardens**
- **Dr. Wayne Stromeyer's Estate**
- **Lake Martin**
- **Ron & Eugenie Belzer's garden**
- **Jim & Kathy Leonard's garden**
- **Avery Island Jungle Garden**
- **Symposium**
- **Judges Training**

If intererested in volunteering, please email the Editor at jaimeclouddesigns@gmail.com.